

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Surry Power Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 8 0 1	PAGE (3) 1 OF 0 4
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TITLE (4) **Increased Off-Site Thyroid Dose Calculations from Steam Generator Tube Rupture Due To Post-Trip Steam Generator Tube Uncovers**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
										0 5 0 0 0
1	2	0 8	8	7	0 3 8	0	1	0 7 8		0 5 0 0 0

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)				
POWER LEVEL (10) 110	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.38(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(d)	
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)		
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)		
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)		
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)			

LICENSEE CONTACT FOR THIS LER (12)	
NAME D. L. Benson, Station Manager	TELEPHONE NUMBER AREA CODE: 8 0 4 3 5 7 3 1 8 4

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14) <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On December 8, 1987, with Unit 1 at 100% power and Unit 2 in cold shutdown, it was determined that the upper portion of the steam generator tube bundle may uncover following a reactor trip. The previous analysis had assumed that the tube bundle would remain covered. This condition was discovered when a review of the expected Surry station steam generator post-trip response was performed as a follow-up item to the July 15, 1987 North Anna steam generator tube rupture event. Uncovering the break location has the effect of reduced iodine partitioning and results in increased calculated offsite thyroid dose for the postulated steam generator tube rupture event. A re-analysis of this event was made and indicates that while the calculated offsite thyroid doses are increased, they remain well below the 10CFR100 limits.

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TEXT (if more space is required, use additional NRC Form 366A's) (17)

1.0 Description of the Event

On December 8, 1987, with Unit 1 operating at 100% power and Unit 2 in cold shutdown for a maintenance outage, it was determined that the upper portion of the steam generator tube bundle may uncover following a reactor trip. This condition was determined to have the effect of increasing the calculated offsite thyroid dose during the postulated steam generator tube rupture (SGTR) event and is reported pursuant to the requirements of 10CFR50.73(a) (2)(ii). The duration of the uncovered tube bundle, using UFSAR assumptions of only one high head safety injection pump and 50% auxiliary feedwater flow, is approximately fourteen (14) minutes. During this time, the iodine partitioning factor (PF) used for offsite dose calculations was increased from the previously assumed value of 0.01 (no uncovered tube bundle) to 1.0 (assumes tube leakage occurs in uncovered portion of tube). This increase in PF was applied to the SGTR event safety analysis and revised offsite dose calculations were performed. The results of this re-analysis are included in Table I. The re-analysis was performed using the existing UFSAR assumptions for operator response time and emergency equipment availability.

2.0 Safety Consequences and Implications

Results of the SGTR re-analysis, taking into account the uncovered tube bundle, indicate that calculated offsite thyroid doses are increased. However, revised offsite doses remain well below the limits set forth in 10CFR100.

3.0 Cause

This condition was discovered when the expected post-trip response during a postulated steam generator tube rupture was examined for the Surry units. This was done following the North Anna tube rupture event to determine if post-trip tube uncover was predicted for Surry. The evaluation predicted that the level dropped below the top of the tube bundle.

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

The previous analysis had assumed that the tube bundle would remain covered following the reactor trip. As previously stated, uncovering the break location has the effect of reduced iodine partitioning and results in increased calculated offsite thyroid dose for the postulated SGTR event.

4.0 Immediate Corrective Action(s)

An initial estimate of the expected dose was made and calculated to be below the 10CFR100 limits.

5.0 Additional Corrective Action(s)

A re-analysis of the postulated SGTR event was made to calculate offsite dose and verify the expected dose was within applicable limits.

6.0 Action Taken to Prevent Recurrence

None.

7.0 Similar Events

Other plants with Westinghouse NSSS may be susceptible to this condition if post-trip tube uncover is predicted for their steam generators.

8.0 Manufacturer/Model Number

Westinghouse Model 51-F Vertical U-tube Steam Generator

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TABLE I

Surry Steam Generator Tube Rupture
Comparison of Calculated Doses to Limits

Integrated Dose at Exclusion Area Boundary (REM)

	<u>Calculated Thyroid/WB</u>	SRP Section 15.6.3 <u>Acceptance Guideline Thyroid/WB</u>	10CFR100 <u>Limit Thyroid/WB</u>
Existing UFSAR Case	0.25/0.27	Not Addressed	300/25
Case 1	11.8/0.082	300/25	300/25
Case 2	6.8/0.090	30/2.5	300/25

Case 1: Same assumptions as existing UFSAR case, except revised steam generator response, i.e., uncovered tube bundle is included, RCS and steam generator secondary activity is equal to maximum allowable Technical Specification values and a pre-accident iodine spike has occurred.

Case 2: Same as Case 1, except iodine spike is concurrent with the accident.

VIRGINIA ELECTRIC AND POWER COMPANY
Surry Power Station
P. O. Box 315
Surry, Virginia 23883

January 7, 1988

U.S. Nuclear Regulatory Commission
Document Control Desk
016 Phillips Building
Washington, D.C. 20555

Serial No.: 87-044
Docket No.: 50-280
Licensee No.: DPR-32

Gentlemen:

Pursuant to Surry Power Station Technical Specifications, Virginia Electric and Power Company hereby submits the following Licensee Event Report for Surry Unit 1.

REPORT NUMBER

87-038-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be reviewed by Safety Evaluation and Control.

Very truly yours,



David L. Benson
Station Manager

Enclosure

cc: Dr. J. Nelson Grace
Regional Administrator
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30323

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